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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,473	01/23/2004	Steven Don Arnold	H0004623-2900	6656

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Ephraim Starr, Division General Counsel
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EXAMINER

TRIEU, THAI BA

ART UNIT	PAPER NUMBER
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3748

DATE MAILED: 08/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/763,473	Applicant(s) ARNOLD ET AL.	
	Examiner Thai-Ba Trieu	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>05/14/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: **"diameter 56"** (See Page 7, line 30; and Page 8, lines 1 and 3). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **"28"** (See Figure 1). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled

"Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

1. IN THE ABSTRACT:

Since the Abstract is too long, Applicants are required to submit a substitute abstract to meet the requirement set forth below:

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within **the range of 50 to 150 words**. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. IN THE SPECIFICATION:

The disclosure is objected to because of the following informalities:

- On page 5, line 2, "**turbine 17**" should be replaced by -- **turbine wheel 17** -- (for consistency of the whole specification).

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- On Page 7, line 21, applicant should review and revise the paragraph starting with "... both greatly reduce...", since **"both"** are to be referenced to which elements reducing the amount of crank arm rotation.

Appropriate correction is required.

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: specifically, in claim 9, line 2, the recitation of **"means for maintaining"** should be incorporated with the specification.

Claim Objections

Claims 1, 7 and 13 are objected to because of the following informalities:

- In claim 1, line 1; claims 7 and 13, line 5, -- **ring** -- should be inserted after **"unison"** (for consistency with the specification and claims).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically:

1. In claim 1, lines 7-8; claim 7, lines 6-7 and 9; and claim 12, lines 6 and 9-10, the recitation of "a number of teeth" renders the claims indefinite, it is not clear that how many teeth the pinion gear and rack gear should have in order to improve the efficiency of an actuation assembly as applied in a variable geometry turbocharger. Applicants should define the number of the teeth.

2. In claim 2, lines 2-3, the recitation of " a predetermined degree of unison ring thermal expansion and contraction movement" renders the claim indefinite, since it is not clear how the applicants can predetermine the degree of unison ring thermal expansion and contraction movement, without defining the material of the unison ring.

Additionally, the term of "a desired distance" renders the claim indefinite, since how long the distance is a desired distance to be maintained between the first and second gear members, such as 1mm, 2 mm, 3 mm, etc... Applicants should clarify the length of a desired distance.

5. In claim 5, line 3, the recitation of " a desired degree" renders the claim indefinite, since it is not clear that which degree will be a desired degree of movement between the unison ring and rack gear. Applicant should define the degree being considered as a desired one of movement between the unison ring and rack gear.

6. In claim 9, line 2, the recitation of "a predetermined tolerance" renders the claim indefinite, since applicants do not define how wide a tolerance between the rack gear and the pinion gear is a predetermined tolerance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-13 are rejected under 35 U.S.C. 102(b) as best understood as being anticipated by Hefler et al. (Patent Number 3,243,159).

Regarding claims 1-6, Hefler discloses an actuation assembly (10) for moving in unison ring (19) a plurality of aerodynamic vanes (24) disposed within a variable geometry turbocharger that includes an actuator coupled to a movable unison ring (19) disposed within a turbocharger turbine housing (11) and attached to the plurality of aerodynamic vanes (24), the actuation assembly comprising a crank arm (36) rotatably disposed within the turbine housing (11) and attached at a first end to the actuator and to a second end to the unison ring (19), wherein the crank arm second end includes a first gear member (35) comprising a number of teeth, and the unison ring (19) includes a second gear member (26) comprising a number of teeth, and wherein the teeth of the first and second gear members are cooperatively engaged with one another (See Figures 1 and 4);

wherein the second gear assembly (26) is movably coupled to the unison ring (19) to permit a predetermined degree of unison ring thermal expansion and contraction movement during turbocharger operation while maintaining a desired distance between the first and second gear members (See Figure 4);

wherein the first gear member (35) is a pinion gear and the second gear member (36) is a rack gear (34) (See Figure 4);

wherein the rack gear (26, 34) and unison ring (19) are coupled to one another by cooperative surface features (See Figures 1-2 and 4);

wherein the cooperative surface features comprise a tongue (27) that cooperates within an opening (28), and wherein the tongue and opening are sized to permit a desired degree of movement between the unison ring (19) and rack gear (26, 34) (See Figures 1-2 and 4); and

wherein the tongue (27) projects outwardly from the unison ring (19), and the opening (28) is disposed within a surface of the rack gear (26, 34) (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Regarding claims 7-11, Hefler discloses a turbocharger assembly comprising:

a turbine housing (11);

a turbine wheel (15) carried within the turbine housing and attached to a shaft (16);

a plurality of vanes (24) pivotably disposed within the turbine housing (11);

a unison ring (19) attached to the plurality of vanes (24) to move the vanes in unison ring (19) with one another, the unison ring (19) including a first gear member (26, 34) having a number of teeth attached thereto; and

a crank arm (36) disposed within the turbine for moving the unison ring (19), the crank arm including a second gear member (35) at one of its ends having a number of teeth that are engaged with the teeth of the first gear member (26, 34) (See Figures 1-2 and 4);

wherein the first gear member (26, 34) is a rack gear and the second gear member (35) is a pinion gear;

means for maintaining a predetermined tolerance between the rack gear (26, 34) and the pinion gear (35) during operation of the turbocharger; comprising a cooperative attachment between the rack gear (26, 34) and the unison ring (19); wherein the cooperative attachment comprises a tongue (27) that projects from one of the unison ring (19) and rack gear (26, 34), into an opening (28) of the other of the unison ring and rack gear (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Regarding claim 12, Hefler discloses a turbocharger assembly comprising:

a turbine housing (11);

a turbine wheel (15) carried within the turbine housing and attached to a shaft (16);

a plurality of vanes (24) pivotably disposed within the turbine housing (11);

a unison ring (19) attached to the plurality of vanes (24) to move the vanes in unison ring with one another, the unison ring including a rack gear (26, 34) having a number of teeth attached thereto;

a crank arm (36) disposed within the turbine for affecting movement of the unison ring (19), the crank arm including a pinion gear (35) at one of its ends that has a number of teeth that are engaged with the teeth of the rack gear (26, 34); wherein the gear rack (26, 34) is movably attached to the unison ring (19) to permit a predetermined degree of unison ring thermal movement during turbocharger operation while maintaining a desired tolerance between the pinion gear and rack gear (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Regarding claim 13, the method as claimed would be inherent during the normal use and operation of Hefler device as disclosed (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Conclusion

The IDS (PTO-1449) filed on May 14, 2004 has been considered. An initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Arnold (US Patent Number 6,679,057 B2) discloses a variable geometry turbocharger.

- Groskreutz et al. (US Patent Number 6,527,508 B2) discloses an actuator crank arm design for a variable geometry turbocharger.
- Arnold et al. (US Patent Number 6,269,642 B1) disclose a variable geometry turbocharger.
- Salvage et al. (US Patent Number 6,129,511) disclose a method and apparatus for controlling interaction between variable guide vanes and variable diffuser of a centrifugal compressor.
- Horn, Jr. (US Patent Number 4,737,071) discloses a variable geometry centrifugal compressor diffuser.
- Houghton (US Patent number 2,985,427) discloses adjustable blading for fluid flow machines.
- White (US Patent Number 2,739,782) discloses a variable area turbine nozzle.
- Thompson (US Patent Number 2,392,200) discloses a centrifugal compressor).
- Brown (Patent Number GB 138,592) discloses an improvement apparatus for varying the adjustment of the guide blades in a centrifugal compressor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (703) 308-6450. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (703) 308-2623. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTB
August 9, 2004



Thai-Ba Trieu
patent Examiner
Art Unit 3748